Chapter 6: Baseline Train Performance Model

The following is a summary of the Train Simulation Report for the Baseline Train Performance Model. This report can be found in its entirety in Appendix G.

6.1 Overview

The Train Simulation Report for the Baseline Train Performance Model summarizes the findings of base case condition and train simulation on the existing track alignment between South Norwalk and New Milford, Connecticut. The report discusses the initial baseline development and a revised baseline based on instructions from Metro-North Railroad (MNR). The objective of this train simulation is to create a model of the train consist and the track alignment and to compare the runtimes against the existing MNR schedule. The latest public schedule shows trip times between Danbury and South Norwalk of 53 minutes for the inbound trip and 55 minutes for the outbound.

The simulation includes end-to-end train run, stopping at each passenger station, for the outbound and inbound directions, except at Georgetown. The overall alignment is approximately 40 miles in each direction, is at-grade with a short tunnel section and 12 passenger stations, including one planned at Georgetown. The study train consist includes five coach cars type MNR 6300, a cab car type MNR 6300 at the end, and MNR Loco P32 Diesel mode in a push-pull configuration.

The analysis was conducted using Railsim Version 7 software. Specifically, the module used in the analysis was the Train Performance Calculator (TPC).

6.2 Initial Baseline

The simulated runtime including dwells for the outbound direction between South Norwalk and Danbury was approximately 65 minutes. For the inbound direction, the simulated runtime between Danbury to South Norwalk was about 59 minutes. The station-to-station runtimes are included in summary sheets A-1 and A-2 in the appendix of the complete report. All criteria and input parameters are also described in the complete report. The analysis suggests that the simulated runtimes are longer than the existing schedule, and the deviation may be attributed to the assumed dwell times and/or the wheel to rail adhesion coefficient rate, which was assumed to be 6% instead of normal adhesion of 15%.

A draft report discussing the initial baseline development was prepared and discussed at a meeting with MNR on January 12, 2009. At the meeting, MNR gave instructions for preparing a revised baseline.

6.3 Revised Baseline

Using a 15% adhesion coefficient that reflects normal rail conditions, the simulated outbound runtime including dwells between South Norwalk and Danbury was 58 minutes 35 seconds. The

simulated inbound runtime from Danbury to South Norwalk was57 minutes 31 seconds. The four revised baseline station-to-station runtimes are included in summary sheets B-1, B-2, C-1, and C-2 in the appendix of the complete report. All criteria and input parameters are also described in the complete report.

The analysis suggests that the revised simulated runtimes are about 6% longer than the schedule. This deviation may be attributed to the assumed dwell times. Additionally, the runtime utilizing a wheel to rail adhesion coefficient rate of 15% is about 10% shorter than that using 6% adhesion coefficient, in the same direction.